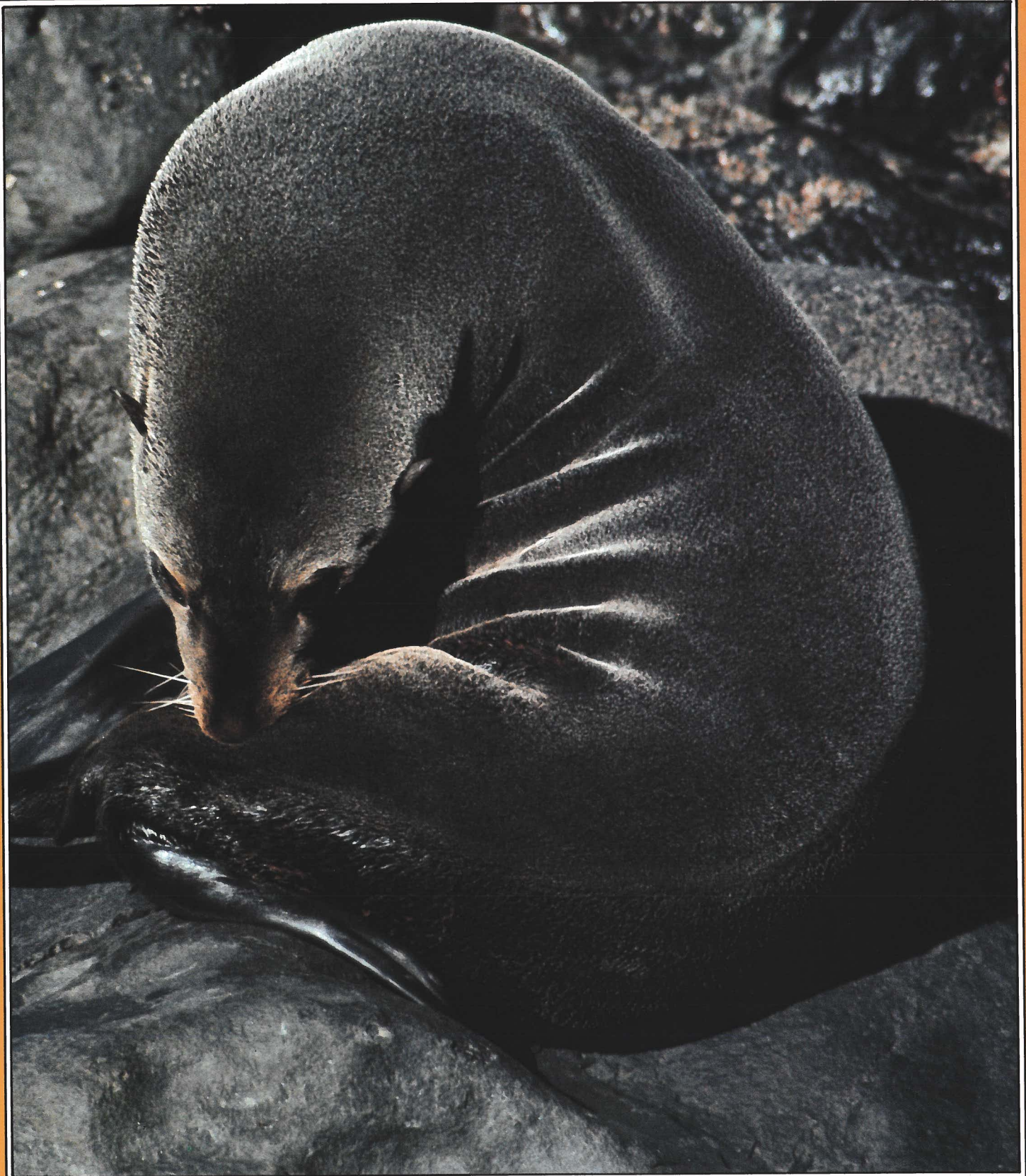


# ENVIRONMENT SOUTHWEST

SAN DIEGO NATURAL HISTORY MUSEUM



AUTUMN 1984 — NUMBER 507



**San Diego Society  
of Natural History**

**Board of Trustees**

H. Michael Collins \_\_\_\_\_ President  
Mrs. James C. Haugh \_\_\_\_\_ 1st Vice President  
Hugh C. Carter \_\_\_\_\_ 2nd Vice President  
Mrs. Timothy Cohelan \_\_\_\_\_ Secretary  
Judge Richard J. Hanscom \_\_\_\_\_ Treasurer  
Mrs. G. Stuart Bruder, Richard S. Bundy,  
George L. Byrum, Mrs. J. Dallas Clark,  
James M. Dort, Ms. Eve Ewing,  
Mrs. Val P. Farrell, David E. Groce, Ph.D.,  
Kenneth E. Hill, Dr. Aline Hornaday,  
Albert W. Johnson, Ph.D.,  
Robert L. Matthews, Ph.D., David M. Miller,  
Rudolph J. Rehm, Richard H. Rosenblatt, Ph.D.,  
Allan P. Shaw, John D. Thelan, J.D.,  
Milo A. Youel, M.D.  
Baylor Brooks \_\_\_\_\_ Trustee Emeritus  
George Loveland \_\_\_\_\_ City Representative

**Natural History Museum**

Charles A. McLaughlin, Ph.D. \_\_\_\_\_ Director  
Betsy Sanders \_\_\_\_\_ Editor  
Rosemarie Fiebig \_\_\_\_\_ Editorial Assistant  
The Museum is open 10 a.m. to 4:30 p.m. daily  
except Thanksgiving, Christmas and New Year's Day

Environment Southwest (USPS 177-620) is published quarterly by the San Diego Society of Natural History, P.O. Box 1390, San Diego, California 92112, (619) 232-3821. Members subscribe through their dues. Annual subscription: \$6.00. Single copies \$1.50. No part of this periodical may be reproduced without prior consent of the editor. Views expressed by the authors are not necessarily those of the Society.

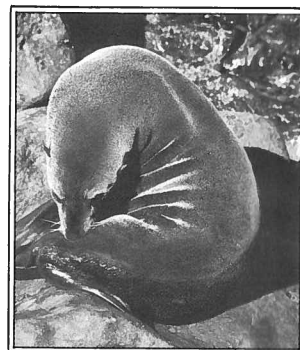
Second Class Postage paid at San Diego, California  
Statement of Ownership, Management & Circulation (Act of October 23, 1962, Sec. 4369, Title 39, U.S. Code) Filed: 10-1-83, Title: *Environment Southwest*. Four issues yearly. Office Location: Balboa Park, San Diego, Calif. 92101.  
No stockholders.

©1984, San Diego Society of Natural History

**Contents**

<b>Financial Report</b>	<b>3</b>
<b>Balboa Park</b> Photos by Marjorie Rea	<b>4</b>
<b>From the Director of the Museum</b>	<b>6</b>
<b>Introducing our Trustees</b>	<b>7</b>
<b>At the Museum</b>	<b>8</b>
<b>Museum Donors</b>	<b>12</b>
<b>People and Rocks: Geologists at the Museum</b> by Frederick R. Schram	<b>14</b>
<b>Another Chance for the Fur Seals</b> by William T. Everett and Brent Stewart	<b>19</b>

**Our cover . . .**  
*Guadalupe Fur Seal*  
Photo by Steve Leatherwood.



**EXPEDITIONS!**

The next issue of *Environment Southwest* will take readers on a variety of expeditions:

To the chilling Antarctic with  
Dr. Eric Shulenberger

To the wilds of Baja California with  
Dr. Hans Bertsch

To a spectacular fossil bone-bed in a San  
Diego canyon with Thomas Deméré

To Joshua Tree National Monument with  
Sandra Keith



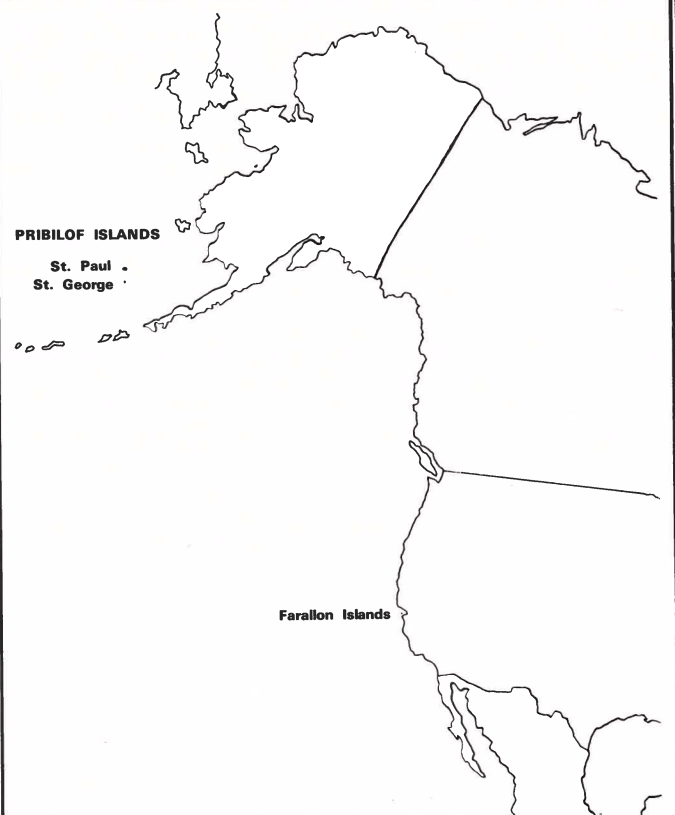
# Another Chance for the Fur Seals

By William T. Everett and Brent S. Stewart

Man's historic relationship with the oceans and its creatures is, unfortunately, replete with unpleasant memories. One scenario repeats itself with depressing familiarity: a wild species, newly discovered, is pursued for economic gain and reduced to such low levels that continued exploitation becomes economically unfeasible (i.e., commercial extinction). Many species have, in this manner, been persecuted to near extinction. Among the mammals of the sea, the stories of the depletion of the sea otter and great whales, and extinction of the Steller sea cow are well-known. But this is not their story; this is the saga of the fur seals of the world—nine species—whose survival today is in no measure owing to man's benevolence.

By the beginning of the 19th century, the great age of oceanic exploration was nearly at an end. Italian, Dutch, Spanish, Portuguese and British vessels in the 16th through 18th centuries had sailed the world's oceans and returned home with tales of incredible riches easily available for the taking. More important, they brought with them navigation charts which would allow merchants to follow more safely in their paths. The lure of unguarded riches subsequently pulled many ships to sea, ushering in a new age of commercial exploitation. More valuable than the gold and gems of the New World, was the abundant life—virgin and vulnerable—to be found in the cool polar and sub-polar waters of the Northern and Southern hemispheres.

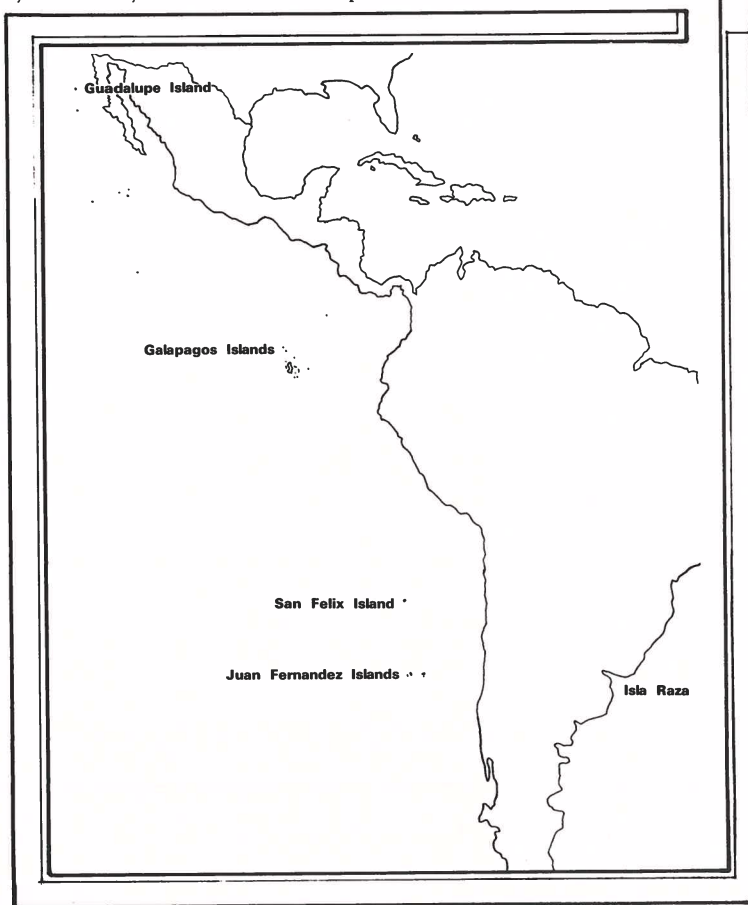
Whale hunters were first on the scene. A single whale would yield many barrels of fine lamp oil and much baleen (the food



filter plates from the whale's mouth). Baleen was in great demand because of its flexibility and strength. It was used for corset stays, buggy whips and a variety of other products now commonly made of plastic. A properly outfitted ship could process whales at the whaling grounds almost as fast as they could be caught, and then return home with a full load. The continuing exploitation and relentless slaughter of the great whales is well-known, but it has been paralleled by another grim harvest, less well-known yet equally devastating.

In search of fresh water and food, many of these early whaling ships visited remote oceanic islands. There they often encountered vast numbers of seals, sometimes crowding the beaches so densely that landings were hazardous or impossible. Among those discovered were the fur seals—seals with thick double layers of fine hairs which insulated them from the cold waters in which they had lived, unmolested, for centuries. The whalers found the pelts to be of high quality and the harvest began. Once news of these discoveries spread, the response was instantaneous. Many American, British and Russian vessels set out solely to take seal skins, while some combined both whaling and sealing ventures for maximum profit. Many of the ships would fill their holds with the salted skins and set sail for China, where they could trade for goods highly prized in Europe and America, thereby making their voyage even more profitable. Although early locations of most fur seal species' rookeries are known, their initial population sizes may only be surmised by the number slaughtered in the ensuing years.

The sealers' methods were simple. Once a rookery or hauling area was found, they set up camp and slaughtered the animals when they came ashore to pup, breed, molt or rest. Because most seals had never encountered terrestrial predators, they were fearless on land and would make no attempt to escape, even as the slaughter was taking place among them. For a man to kill



and skin 50 seals was a good day's work. In some seasons over 40 ships had gangs of men working a single island. Responding to instinct, the ever-diminishing stocks of remaining seals continued to return to the same beaches year after year. Seals were killed regardless of age or sex until so few remained that it was no longer economically feasible to continue the hunt; the sealers then moved on.

The systematic destruction of most species of fur seals is recorded in the log books of many sealing vessels. Commercial sealing appears to have begun on a small scale in Uruguay in about 1515 and in South Africa around 1680-1700. Large scale operations actually began in the late 1700s at the Malvinas (Falkland) Islands and around Cape Horn after discovery of these rookeries in 1774 by Yankee whalers. As early as 1791, sealing began on the Juan Fernandez and San Felix Island groups off the coast of Chile. As many as 3.5 million skins were taken for the China trade between 1797 and 1804. Sealing became unprofitable there by 1807, and by 1827 the rookeries, which at one time had supported the largest number of fur seals in the Southern Hemisphere, were deserted.

The Amsterdam fur seal on Gough Island was exploited to near extinction between 1790 and 1830, then plundered again between 1869 and 1890 after a partial recovery. At the Antipodes Islands the New Zealand fur seal was first exploited in 1804; in 1814, alone, 400,000 seals were slaughtered. At Macquarie Island this species was discovered in 1810 and rapidly annihilated. Harvesting of the Kerguelen and Amsterdam Island fur seals on Prince Edward and Marion Islands began early in the 19th century and these species were rapidly brought to commercial extinction.

The Kerguelen fur seal at South Georgia was heavily exploited in the late 1700s and early 1800s. Between 1775 and 1822 not less than 1.2 million skins were taken and by 1822 the species was practically extinct. Sealing was briefly resurrected at South Georgia in the 1870s, but the stocks were so small that within six years no seals remained.

The last of the great fur seal colonies in the Southern Hemisphere was discovered at the South Shetland Islands in 1819 by a trading ship which had been blown off course between Buenos

Aires and Valparaiso. Within three years the resident Kerguelen fur seals were virtually exterminated. In 1820 alone about 250,000 skins were secured by 47 American and British ships. The harvest declined in the next few years and by 1829 no seals were seen at these islands. Sealing at the South Shetlands was briefly and unsuccessfully revived in the 1850s and again in the 1870s.

Bordering on the equator, the Galapagos Islands ("Enchanted Islands") were frequently visited by whalers who stopped to take on water and to capture the amazing land tortoises which could stay alive for up to a year in a ship's hold. The tortoises were an excellent source of fresh meat and water, which was unfortunately, nearly the cause of their extinction. At the Galapagos the numbers of seals never approached those of the other island groups but all that were there were taken. Records indicate that at least 22,000 skins were harvested; the real figure is undoubtedly higher.

In the Bering Sea the principal breeding islands of the northern fur seal at St. George and St. Paul Islands were discovered in 1786 and 1787, respectively, by the Russian fur hunter Gerasim Pribilof. Unrestricted slaughter followed and the populations were in danger of complete annihilation between 1806 and 1834. Between 1835 and 1867 the harvest of male seals on these islands was restricted and the taking of females forbidden.

The Pribilof Islands were acquired by the United States in 1867 with the purchase of Alaska, but during the period of Russian ownership approximately 2.5 million skins had been taken. With the Alaska purchase came renewed exploitation, this time by Americans. Between 1868 and 1869 over a quarter of a million seals were killed. An annual harvest quota of 100,000 was set in 1869. Quotas were consistently reduced after 1889 and annual harvests averaged 15,000 to 30,000 thereafter. However, the killing of seals at sea began in 1886 and quickly developed into an intense and uncontrolled industry. At least 650,000 seals, mostly lactating females, were killed in this manner between 1886 and 1892. The species declined steadily until 1911 when pelagic sealing was banned by International Treaty.

On Los Islas Farallones near San Francisco, California, one vessel took 130,000 fur seal skins between 1808 and 1810, most of which were northern fur seals. The population there crashed and was exterminated; only a few seals have occasionally hauled out during winter in the past few years.

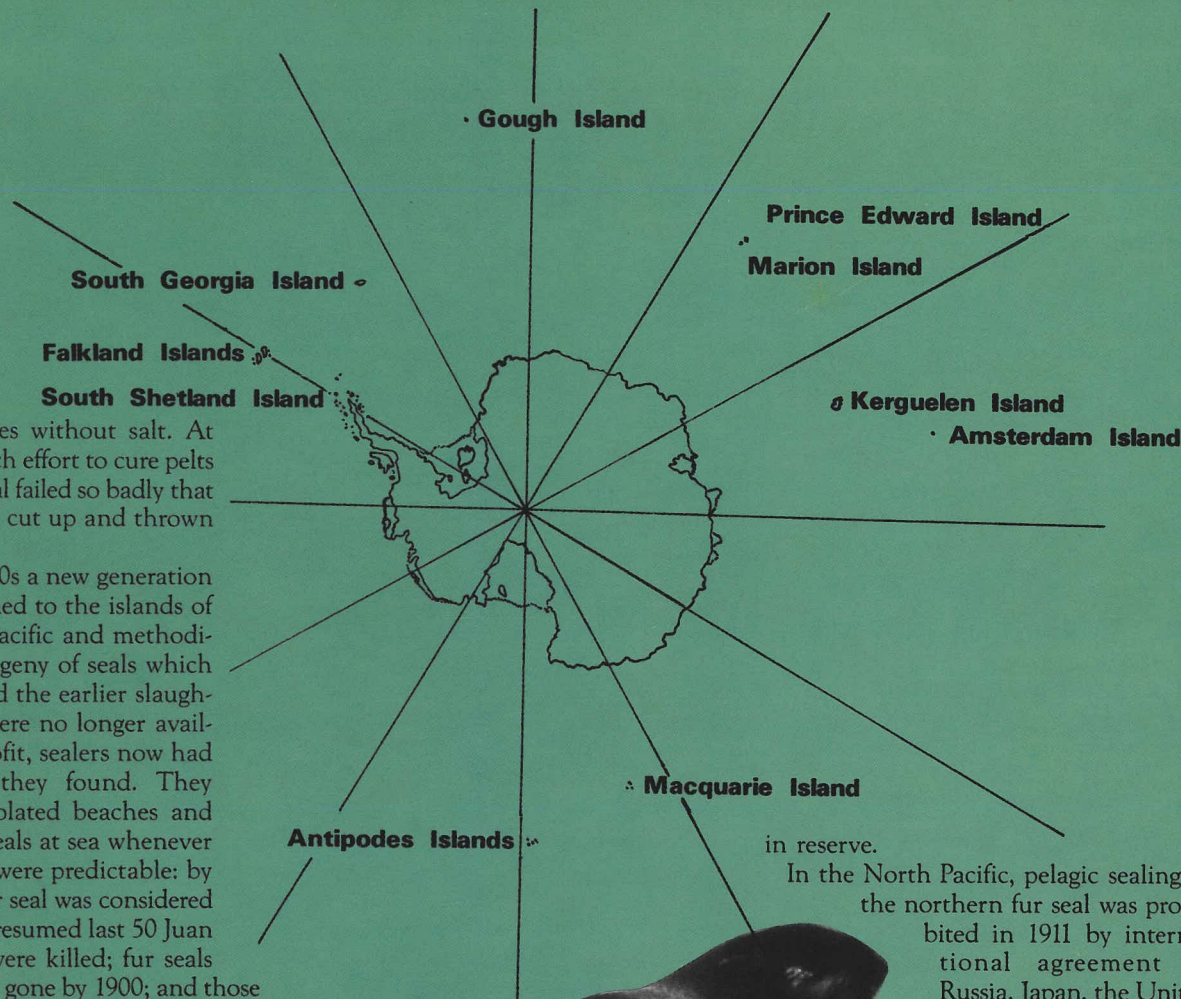
The Guadalupe fur seal was heavily exploited throughout its range from central Alta California to southern Baja California. Vast numbers must have been taken from Guadalupe Island (off the Baja coast), as volcanic rocks of this oceanic island have been polished smooth by seal flippers over the ages. By 1818 this species too was assumed extinct.

The competition among sealing vessels was fierce owing to the enormous profits to be made. Greed accompanied by waste was rampant. Pups were left to die after their mothers had been killed, because larger animals yielded bigger skins. One vessel, the *Pegasus*, loaded over 100,000 skins at South Georgia but did not have enough salt to adequately cure the hides. The cargo arrived in London so badly rotted it had to be dug out and sold as manure. In the early days attempts were



*Southern fur seals on South Georgia Island. Photo by J.R. Jehl, Jr.*





made to air dry hides without salt. At Sitka, Alaska, one such effort to cure pelts of the northern fur seal failed so badly that 750,000 of them were cut up and thrown out into the sea.

During the late 1800s a new generation of seal hunters returned to the islands of Antarctica and the Pacific and methodically pursued the progeny of seals which had somehow escaped the earlier slaughter. The vast herds were no longer available so, to make a profit, sealers now had to take every seal they found. They scoured the more isolated beaches and rookeries, and took seals at sea whenever possible. The results were predictable: by 1888 the Antarctic fur seal was considered extinct; in 1898 the presumed last 50 Juan Fernandez fur seals were killed; fur seals of the Galapagos were gone by 1900; and those of the California islands were gone by 1895.

The pattern of exploitation was repeated whenever seals were encountered. Following discovery, uncontrolled slaughter and harvest reduced the stocks to levels where they could no longer be exploited for profit. The extent of the tragedy was not fully appreciated until the early 1900s, when scientific explorations found that the formerly abundant animals were now dry, bleached skeletons. When bones from many fur seal rookeries were compared in museums, it was discovered that the isolated populations were often, in fact, distinct species driven to near extinction before they were even recognized as such.

This set in motion the last sad chapter of the already dismal story. Museums were eager to add representative specimens of the newly described species to their collections, so scientists and professional collectors set out to meet this new demand. A Stanford University expedition to the Galapagos Islands in 1898-99 took what they thought were the last 224 Galapagos fur seals; but in 1906 Rollo H. Beck found a single fur seal there—it was quickly dispatched! For several decades searches were undertaken but the results were always the same—no seals.

Fortunately, men of earlier eras did not have the sophisticated equipment or ships that permit the present-day rapacious exploitation of the ocean's resources. Nature was able to hold a little

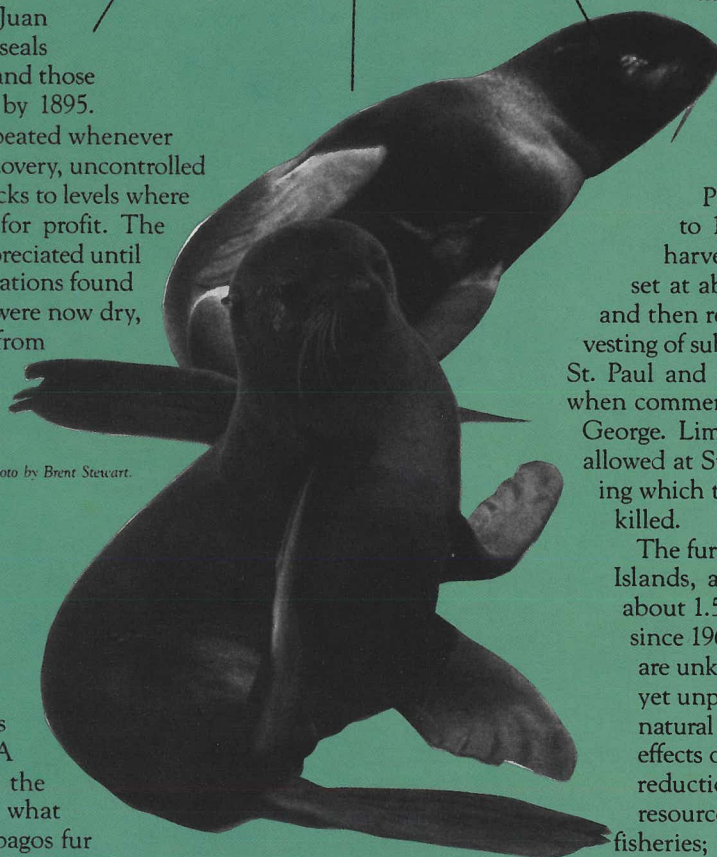
in reserve.

In the North Pacific, pelagic sealing of the northern fur seal was prohibited in 1911 by international agreement of Russia, Japan, the United States and Canada. The species slowly began its recovery. Killing of seals at the Pribilofs was banned from 1912 to 1917. Annual quotas allowing harvest of subadult males only were set at about 35,000 from 1918 to 1920 and then reduced to 30,000 in 1921. Harvesting of subadult males continued at both St. Paul and St. George Islands until 1973 when commercial sealing was banned at St. George. Limited harvests of females were allowed at St. Paul from 1956 to 1968, during which time about 320,00 females were killed.

The fur seal population on the Pribilof Islands, although presently numbering about 1.5 million, has declined steadily since 1960. The reasons for this decline are unknown but possible (although as yet unproven) explanations include: a natural cycle in population growth; the effects of the recent harvest of females; reduction of fish stocks (i.e., food resources of fur seals) by commercial fisheries; and mortality of seals by entanglement in discarded fishing gear (gill nets) and in high seas drift gill nets.

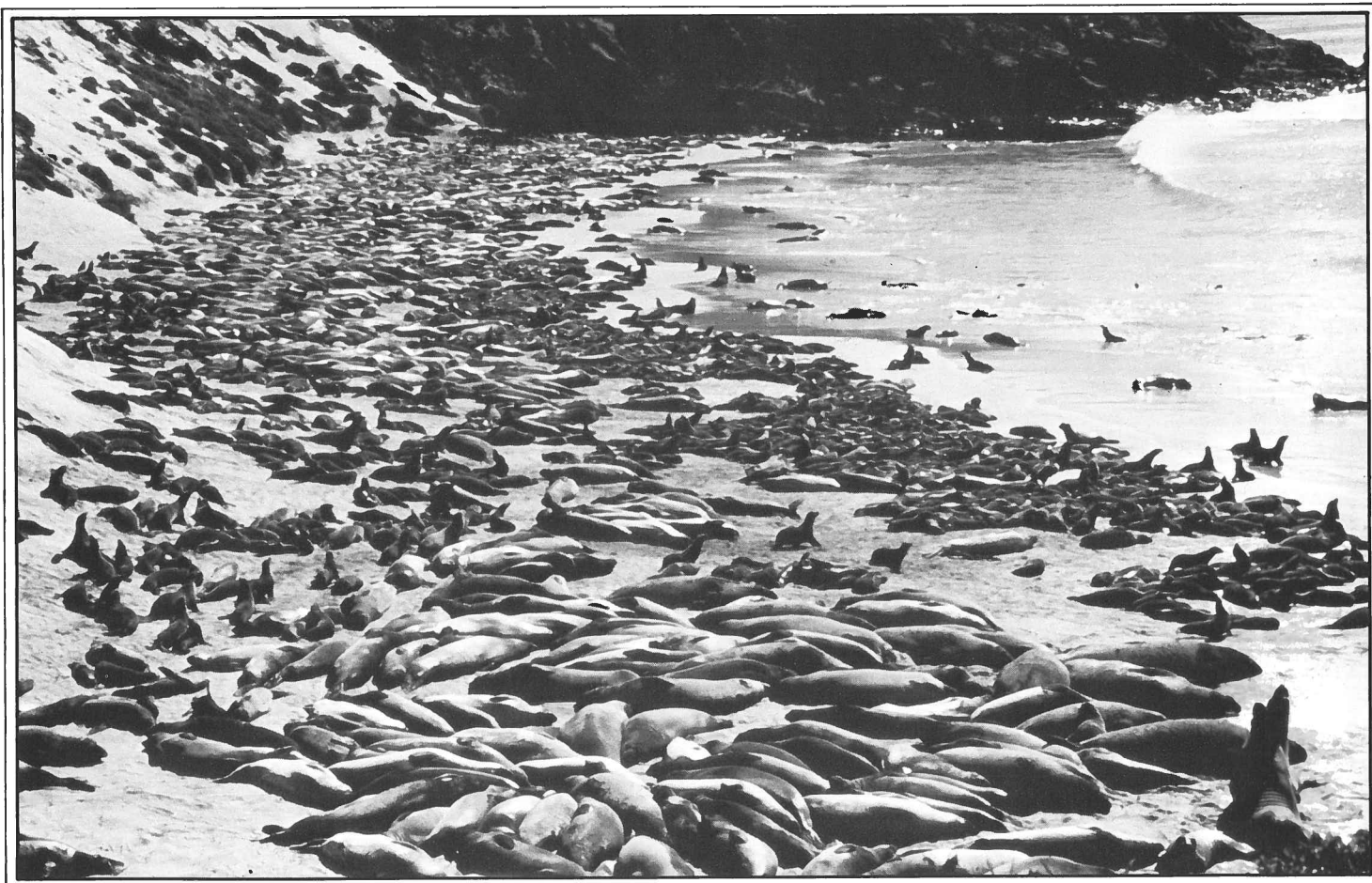
About 25,000 three- to four-year-old males continue to be harvested each year at St. Paul to satisfy commitments to the North Pacific Fur Seal Act of 1964 (an extension of the 1911 treaty). The future of the commercial harvest is uncertain as the Act

Photo by Brent Stewart.



Northern fur seals.





*Formerly vacant beaches, now fully protected, are once again populated with vast numbers of seals and sea lions such as these at Tyler Cove, San Miguel Island. Photo by Brent Stewart.*

is scheduled for renewal in 1984. The United States Government has recently withdrawn its financial support for the harvest and has encouraged transition of the St. Paul community to a commercial fishery based economy.

The late 1920s and 1930s brought good news regarding two of the Southern Hemisphere fur seal species. The Antarctic fur seal was rediscovered on South Georgia, given protection, and thus began one of the most astounding recoveries known for any animal species. The next 20 years produced a population explosion for this species on South Georgia, which by 1950 had recolonized several other rookeries and numbered around 20,000. They now number more than 600,000 and are reoccupying much of their former range.

A few Galapagos fur seals were found in the 1920s and, although they were captured alive for zoos, it was obvious that the population was slowly increasing. Today they number over 5,000 and have reestablished many small permanent colonies. Their future appears secure.

The Amsterdam Island fur seal on Gough Island, which numbered only about 300 in 1892, exceeds 10,000 at present. This species has also increased on New Amsterdam and Tristan de Cunha Islands in recent years. The New Zealand fur seal has increased in New Zealand from very low levels in the late 19th century to its present abundance of 40,000. The South American or southern fur seal stock on Isla Rasa off Uruguay increased from only 16 in 1954 to over 23,000 in 1970. Other stocks such as the New Zealand fur seal in Australia, the South American fur seal at Falkland Islands and the Antarctic fur seal at Kerguelen Island have remained at low levels and show no signs of grow-

ing. In South Africa and New Zealand, fur seals are still being harvested in large numbers as they are often accused of damaging fish harvests and fishing gear.

For reasons not clearly understood, the fur seals of Guadalupe Island and the Juan Fernandez Islands have increased very slowly. In 1926 two fishermen found a small group of animals on Guadalupe Island that they thought were fur seals. They reported their find to officials at the San Diego Zoo who offered to pay them if they could capture a pair. They succeeded, and on 25 April 1928, they delivered two adult males to the Zoo. When it was determined that they were the long-lost Guadalupe fur seals, scientists were overjoyed. But the fishermen refused to reveal the precise location of their find and a bitter argument with the Zoo officials ensued. One of the fishermen swore he would slaughter the remaining herd, which he estimated at about 60 animals. He apparently carried out his threat, because several expeditions were undertaken shortly thereafter and no seals were found.

In 1949 Dr. George Bartholomew of the University of California at Los Angeles discovered a single Guadalupe fur seal on San Nicolas Island off the coast of Southern California. This ignited hopes that the species was still extant, but in 1950 the animal did not reappear at San Nicolas and a careful search of Guadalupe Island proved unsuccessful. Dr. Carl L. Hubbs of Scripps Institution of Oceanography, however, was determined not to give up the search. His efforts were rewarded in 1954 when he found 14 of the Guadalupe fur seals in residence along the rocky eastern shore of the island. This was the fourth—and hopefully the last—time this species was brought back from the

grave. A meticulous search in 1955 indicated at least 30 fur seals inhabited the remote desert island. Today at least 2,000 fur seals occur on Guadalupe Island and individuals are frequently sighted on islands to the north.

Encouraged by the rediscovery of fur seals at Guadalupe Island, scientists turned their attention to the closely related Juan Fernandez fur seal. In 1958 a rumor was heard that a few fur seals had been seen at one of the Juan Fernandez Islands. Finally, in 1965, a scientist photographed a newborn fur seal at one of the islands, and a month later photographs of adults were taken in the same vicinity. In 1968 an expedition set out to determine the true identity and extent of this fur seal population. They turned out to be the presumed extinct Juan Fernandez species. Nearly 200 were found; today over 500 exist. With this discovery, the last of the once-feared-extinct seal species was resurrected. With time and protection, it too should be on the way to recovery.

Although all species of southern fur seals, and in some places habitats and access to rookeries, are presently protected by national legislation, commercial harvest of at least two species of Southern Hemisphere fur seals continues today to supply pelts, blubber and meat to local markets. The South American fur seal harvest averaged about 78,000 annually from 1970 through 1972 and the current harvest is set at 40% of the number of pups born. Annual harvests of South American fur seal off Uruguay consist of approximately 11,000 seals, most of which are males.

Despite the fact that populations of all species of fur seals seem to be healthy and recovering (although at different rates) from historic exploitation, the spectre of new threats to their future looms on the horizon. Commercial fisheries have come to view

seals and sea lions not only as competitors for a resource but also the source of considerable financial loss through damage to fishery gear. In many areas the urgings for local control of the seals and sea lions grow louder. Oil exploitation poses an uncertain threat to seal populations, through direct contact to oil spills and indirect effects of oil exploitation activities on fish and invertebrate stocks on which the seals feed.

There seem to be three identifiable and currently-held attitudes towards seals, sea lions, and marine mammals in general. The polarized attitudes of (1) those who see seals as pests, competitors, sources of financial loss and threats to business and personal livelihood, and (2) those who see them as harmless, cuddly and intelligent, yet helpless creatures deserving full protection from man's ruthless activities. Both often seem totally uncompromising. The (3) "middle-of-the-road" position has often been taken by state governments and management agencies that recognize the need, on the one hand, to accommodate some of the needs of commercial fisheries which service growing human populations through control or harvest of seals, and, on the other hand, to ensure the future survival of seal populations. This middle-of-the-road position is often attacked by both of the other sides, one claiming that not enough is being done to control seals and the other claiming that not a single individual seal should be "sacrificed."

Considering the present overwhelming public concern for wild life, the future survival of wild fur seal populations appears assured. What is uncertain, however, is what compromise will be made in future decisions regarding man's relationships and interactions with the fur seals. ♡



*Juan Fernandez fur seal. Photo by J.R. Jehl, Jr.*